

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:)
)
Richard D. Bucholz et al.)
)
Serial No.: Unassigned [Divisional) Prior Group Art Unit: 3737
of 09/105,068])
)
Filed: Herewith) Prior Examiner: E. Mantis Mercader
)
For: SURGICAL NAVIGATION)
SYSTEMS INCLUDING)
REFERENCE AND)
LOCALIZATION FRAMES)

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

PRELIMINARY AMENDMENT

Prior to examination of the above-referenced application, please amend the application as follows:

IN THE CLAIMS:

Please cancel claims 1 - 55 without prejudice or disclaimer and add new claims 56-63, as follows:

--56. A method for determining the geometry of a semi-rigid body element during a procedure, the method using an image data set having reference points for the body element, the method comprising:

identifying, during the procedure, the relative position of each of the reference points for the semi-rigid body element;

deriving a transform relating the relative position of the reference points during the procedure to the relative position of the reference points in the image data set in order to determine the geometry of the body element during the procedure;

modifying the image data set based on the transform in order to generate a displaced image data set representing the geometry of the body element during the procedure; and

generating a display based on the displaced image data set illustrating the geometry of the body element during the procedure.

57. The method of claim 56 wherein the semi-rigid body element is soft tissue.

58. A method for determining the geometry and position of a semi-rigid body element during a procedure, the method using a system including an array, an instrument in communication with the array, and a processor in communication with the array and storing an image data set having reference points for the body element, the method comprising:

touching the reference points for the semi-rigid body element with the instrument during the procedure and communicating the position of the reference points to the array;

communicating the position of the reference points of the body element during the procedure to the processor;

determining the relative position of the reference points;

deriving a transform of the relative position of the reference points during the procedure to the relative position of the reference points in the image data set in order to determine the geometry and position of the body element during the procedure;

modifying the image data set based on the transform in order to generate a displaced image data set representing the geometry and position of the body element during the procedure; and

displaying the geometry and position of the body element during the procedure based on the displaced image data set.

59. The method of claim 58 wherein the semi-rigid body element is soft tissue.

60. A system for determining the geometry and position of at least one semi-rigid body element during a procedure, the system comprising:

an image data set of the body element, the image data set having reference points for the body element;

an array of receivers;

an instrument in communication with the array, the instrument identifying the position of the reference points of the body element during the procedure;

a processor in communication with the array and storing the image data set, the processor programmed to modify the image data set based on the identified position of the reference points of the body element during the procedure and to generate a displaced image data set representing the geometry and position of the body element during the procedure; and

a display for displaying the geometry and position of the body element during the procedure based on the displaced image data set generated by the processor.

61. A system for determining the geometry and position of at least one semi-rigid body element during a procedure, the system comprising:

an image data set of the body element, the image data set data points identifying contour reference points for the body element;

an array of receivers;

a scanning probe in communication with the array, the scanning probe determining the contour of the body element during the procedure;

a processor in communication with the array and storing the image data set, the processor programmed to compare the position of the contour of the body element to the position of the contour of the body element as represented by the image data set and to modify the image data set based on the identified position of the contour of the body element during the procedure and to generate a displaced image data set representing the geometry and position of the body element during the procedure; and

a display for displaying the geometry and position of the body element during the procedure based on the displaced image data set generated by the processor.

62. A method for determining the geometry of a deformable body element during a procedure, the body element having reference points, the method comprising:

obtaining an image data set of the deformable body element, the data set including the reference points for the body element;

identifying the relative position of each of the reference points for the body element during the procedure;

deriving a transform relating the relative position of the reference points during the procedure to the relative position of the reference points in the image data set in

order to determine the geometry of the body element during the procedure;

modifying the image data set based on the transform in order to generate a displaced image data set representing the geometry of the body element during the procedure; and

generating a display based on the displaced image data set illustrating the geometry of the body element during the procedure.

63. The method of claim 62 wherein the deformable body element is soft tissue.--

REMARKS

Claims 56-63 are pending in this application. By way of this amendment, Applicants have canceled claims 1 - 55 and added new claims 56-63. These new claims are fully supported by the written description.

Please charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, L.L.P.

By: 

Anthony M. Gutowski
Reg. No. 38,742

Dated: April 12, 2001